

Applicant : Charles M. Olds et al.
For : AUTOMATIC CHANGEOVER REGULATOR
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In the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (canceled)
2. (currently amended) The pressure regulator of claim 1, wherein:
A pressure regulator comprising:
a housing having an interior space, at least one input into the interior space and an output out of the interior space, the housing being configured to have a fluid enter into the interior space through the at least one input and exit the interior space through the output;
a closure member for each input, the closure member selectively covering an associated one of the at least one input for preventing fluid flow into the interior space of the housing;
a diaphragm in the housing, the diaphragm being interconnected to the closure member;
a biasing member for each closure member, the biasing member configured to selectively bias the closure member away from the associated one of the at least one input to allow fluid flow through the input;
wherein the diaphragm is configured to move against the biasing member when pressure in the interior space is above a predetermined amount, whereby the closure member will move in response to movement of the diaphragm to close the at least one input such that fluid is not able to pass into the interior space through the input; and
a stabilizing member in the housing, the stabilizing member surrounding the biasing member for maintaining the biasing member in position;
wherein the at least one input comprises two inputs.
3. (original) The pressure regulator of claim 2, wherein:
the stabilizing member comprises a cup surrounding a bottom of each biasing member.

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4. (original) The pressure regulator of claim 3, wherein:
the diaphragm includes a sleeve for each cup for accepting the cup therein, whereby the cup is located between the biasing member and the diaphragm.
5. (original) The pressure regulator of claim 4, wherein:
the sleeves include a rolling receiver portion; and
the diaphragm includes a substantially flat surface portion surrounding the sleeve, whereby the rolling receiver portion can move with movement of the cup without substantially moving the substantially flat surface portion.
6. (original) The pressure regulator of claim 4, further including:
a stop for each cup, the stop being located within the housing, the stop configured to abut against a top of the cup to prevent upward movement of the cup past the stop.
7. (original) The pressure regulator of claim 2, wherein:
the stabilizing member comprises a plate having a pair of apertures therein, each aperture surrounding one of the biasing members.
8. (original) The pressure regulator of claim 2, wherein:
the housing includes a changeover knob selectively interconnected to one of the closure members, the changeover knob having a first position aligned with a first one of the closure members and a second position aligned with a second one of the closure members;
when the changeover knob is in the first position and the pressure is below the predetermined amount, the first one of the closure members will not cover a first one of the inlets; and
when the changeover knob is in the second position and the pressure is below the predetermined amount, the second one of the closure members will not cover a second one of the inlets.

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9. (original) A pressure regulator comprising:

a housing having an interior space, two inputs into the interior space and an output out of the interior space, the housing being configured to have a fluid enter into the interior space through at least one of the two inputs and exit the interior space through the output;

a pair of closure members, each closure member selectively covering an associated one of the two inputs for preventing fluid flow into the interior space of the housing through the associated one of the two inputs;

a diaphragm in the housing, the diaphragm being interconnected to each closure member;

a pair of biasing members, each biasing member configured to selectively bias one of the closure members away from the associated one of the two inputs to allow fluid flow through the associated one of the two inputs;

wherein the diaphragm is configured to move against the biasing members when pressure in the interior space is above a predetermined amount, whereby the closure members will move in response to movement of the diaphragm to close the inputs such that fluid is not able to pass into the interior space through the inputs; and

a pair of cups, each cup surrounding a bottom of one of the biasing members for maintaining the biasing members in position.

10. (currently amended) The pressure regulator of claim 9, wherein:

the diaphragm includes a sleeve for each cup for accepting the cup therein, whereby the cup is located between the biasing member members and the diaphragm.

11. (currently amended) The pressure regulator of claim 10, wherein:

~~the sleeves include a~~ each sleeve includes a rolling receiver portion; and

the diaphragm includes a substantially flat surface portion surrounding the each sleeve, whereby the rolling receiver portion portions can move with movement of the cup without substantially moving the substantially flat surface portion.

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12. (original) The pressure regulator of claim 11, further including:

a stop for each cup, the stop being located within the housing, the stop configured to abut against a top of the cup to prevent upward movement of the cup past the stop.

13. (original) The pressure regulator of claim 9, wherein:

the housing includes a changeover knob selectively interconnected to one of the closure members, the changeover knob having a first position aligned with a first one of the closure members and a second position aligned with a second one of the closure members;

when the changeover knob is in the first position and the pressure is below the predetermined amount, the first one of the closure members will not cover a first one of the inlets; and

when the changeover knob is in the second position and the pressure is below the predetermined amount, the second one of the closure members will not cover a second one of the inlets.

14. (original) A pressure regulator comprising:

a housing having an interior space, two inputs into the interior space and an output out of the interior space, the housing being configured to have a fluid enter into the interior space through at least one of the two inputs and exit the interior space through the output;

a pair of closure members, each closure member selectively covering an associated one of the two inputs for preventing fluid flow into the interior space of the housing through the associated one of the two inputs;

a diaphragm in the housing, the diaphragm being interconnected to each closure member;

a pair of biasing members, each biasing member configured to selectively bias one of the closure members away from the associated one of the two inputs to allow fluid flow through the associated one of the two inputs;

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wherein the diaphragm is configured to move against the biasing members when pressure in the interior space is above a predetermined amount, whereby the closure members will move in response to movement of the diaphragm to close the inputs such that fluid is not able to pass into the interior space through the inputs; and

a plate having a pair of apertures therein, each aperture surrounding one of the biasing members for maintaining the biasing members in position.

15. (original) The pressure regulator of claim 14, wherein:

the housing includes a changeover knob selectively interconnected to one of the closure members, the changeover knob having a first position aligned with a first one of the closure members and a second position aligned with a second one of the closure members;

when the changeover knob is in the first position and the pressure is below the predetermined amount, the first one of the closure members will not cover a first one of the inlets; and

when the changeover knob is in the second position and the pressure is below the predetermined amount, the second one of the closure members will not cover a second one of the inlets.

16. (original) A pressure regulator comprising:

a housing having an interior space, at least one input into the interior space and an output out of the interior space, the housing being configured to have a fluid enter into the interior space through the at least one input and exit the interior space through the output;

a closure member for each input, the closure member selectively covering an associated one of the at least one input for preventing fluid flow into the interior space of the housing;

a diaphragm in the housing, the diaphragm being interconnected to the closure member; and

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a biasing member for each closure member, the biasing member configured to selectively bias the closure member away from the associated one of the at least one input to allow fluid flow through the input;

wherein the diaphragm is configured to move against the biasing member when pressure in the interior space is above a predetermined amount, whereby the closure member will move in response to movement of the diaphragm to close the at least one input such that fluid is not able to pass into the interior space through the input; and

wherein the diaphragm includes a pair of sleeves, each sleeve having a rolling receiver portion and the diaphragm includes a substantially flat surface portion surrounding the sleeve, whereby the rolling receiver portion can move with movement of the biasing member without substantially moving the substantially flat surface portion.

17. (original) The pressure regulator of claim 16, further including:

a stabilizing member in the housing, the stabilizing member surrounding the biasing members for maintaining the biasing members in position.

18. (original) The pressure regulator of claim 17, wherein:

the stabilizing member comprises a cup surrounding a bottom of each biasing member.

19. (original) The pressure regulator of claim 18, wherein:

each sleeve of the diaphragm includes one cup therein, whereby the cup is located between the biasing member and the diaphragm.

20. (original) The pressure regulator of claim 18, further including:

a stop for each cup, the stop being located within the housing, the stop configured to abut against a top of the cup to prevent upward movement of the cup past the stop.

21. (original) The pressure regulator of claim 16, wherein:

the housing includes a changeover knob selectively interconnected to one of the closure

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members, the changeover knob having a first position aligned with a first one of the closure members and a second position aligned with a second one of the closure members;

when the changeover knob is in the first position and the pressure is below the predetermined amount, the first one of the closure members will not cover a first one of the inlets; and

when the changeover knob is in the second position and the pressure is below the predetermined amount, the second one of the closure members will not cover a second one of the inlets.

22. (new) A pressure regulator comprising:

a housing having an interior space, at least one input into the interior space and an output out of the interior space, the housing being configured to have a fluid enter into the interior space through the at least one input and exit the interior space through the output;

a closure member for each input, the closure member selectively covering an associated one of the at least one input for preventing fluid flow into the interior space of the housing;

a diaphragm in the housing, the diaphragm being interconnected to the closure member;

a biasing member for each closure member, the biasing member configured to selectively bias the closure member away from the associated one of the at least one input to allow fluid flow through the input;

wherein the diaphragm is configured to move against the biasing member when pressure in the interior space is above a predetermined amount, whereby the closure member will move in response to movement of the diaphragm to close the at least one input such that fluid is not able to pass into the interior space through the input; and

a stabilizing member in the housing, the stabilizing member surrounding the biasing member for maintaining the biasing member in position; and

a stop for the stabilizing member, the stop being located within the housing, the stop configured to abut against a top of the stabilizing member to prevent upward movement of the stabilizing member past the stop.

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23. (new) A pressure regulator comprising:

a housing having an interior space, at least one input into the interior space and an output out of the interior space, the housing being configured to have a fluid enter into the interior space through the at least one input and exit the interior space through the output;

a closure member for each input, the closure member selectively covering an associated one of the at least one input for preventing fluid flow into the interior space of the housing;

a diaphragm in the housing, the diaphragm being interconnected to the closure member;

a biasing member for each closure member, the biasing member configured to selectively bias the closure member away from the associated one of the at least one input to allow fluid flow through the input;

wherein the diaphragm is configured to move against the biasing member when pressure in the interior space is above a predetermined amount, whereby the closure member will move in response to movement of the diaphragm to close the at least one input such that fluid is not able to pass into the interior space through the input; and

a stabilizing member in the housing, the stabilizing member surrounding the biasing member for maintaining the biasing member in position;

wherein the stabilizing member comprises a plate having a pair of apertures therein, each aperture surrounding one of the biasing members.

24. (new) The pressure regulator of claim 9, further including:

a stop being located within the housing, the stop configured to abut against a top of the cups to prevent upward movement of the cups past the stop.

25. (new) The pressure regulator of claim 18, further including:

a stop for the stabilizing member, the stop being located within the housing, the stop configured to abut against a top of the stabilizing member to prevent upward movement of the stabilizing member past the stop.

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26. (new) The pressure regulator of claim 9, further including:
a plate having a pair of apertures therein, each aperture surrounding one of the biasing members.

27. (new) The pressure regulator of claim 16, further including:
a plate having a pair of apertures therein, each aperture surrounding one of the biasing members.